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TREATMENT OF APPENDICITIS.

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Since the publication of my last paper on the subject of Appendicitis, under the title of "Inflammation in the Right Iliac Fossa associated with Lesion of the Cæcum, the Vermiform Appendix, and Adjacent Tissues," which appeared in the Philadelphia *Medical News* for August, 1892, I have seen and operated upon a large number of both acute and relapsing cases which have so impressed me with certain points in reference to the pathology, as well as to a different course of treatment, that I feel warranted in presenting my present views to the profession. While the subject of appendicitis has received a great amount of attention from the profession, yet I believe that better rules remain to be formulated for our guidance in the prompt treatment of this dangerous disease. In the paper referred to I divided inflammation in the right iliac fossa associated with lesion of the cæcum, the vermiform appendix, and adjacent tissues, into intra- and extra-peritoneal. I proposed that the term intra-peritoneal inflammation should include all cases of inflammation in the right iliac fossa having their origin within the peritoneum and associated with lesion of the cæcum or the appendix, for the following reasons: (1) I believe it impossible to differentiate between appendicitis, typhlitis, and peri-typhlitis; (2) I believe the terms typhlitis and peri-typhlitis to be misleading, and as long as it is taught that they are distinct affections, independent of trouble with the appendix, just so long will the physician be misled as to the true character of inflammation in this region. As a result of this classification and teaching, cases are treated on the so-called "expectant" plan, and there is delay from day to day in the hope that the case may prove to be one either of typhlitis or peri-typhlitis, and that operation is not so urgently called for as in appendicitis. I consider it nothing more than a mere refinement to divide inflam-

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mation of the cæcum into inflammation of the gut proper and inflammation of its serous covering (peri-typhlitis), as there can be no practical value in such a division, as both conditions require a common treatment; and, further, I do not believe it possible to make the differentiation of these conditions at the bedside. It has been my fortune to have seen a large number of cases of inflammation in the right iliac fossa, as well as to have operated on many, and I think I have clearly demonstrated to my own satisfaction that the best classification of the three pathological conditions, appendicitis, typhlitis, and peri-typhlitis, is under the head of intra-peritoneal inflammation in the right iliac fossa. In the greater number of cases of inflammation in the right iliac fossa the vermiform appendix is the organ primarily attacked, yet there are cases which have been demonstrated by post-mortem examination in which the cæcum alone is the seat of the trouble; but in those fatal cases where both the cæcum and the appendix are found to have been the seat of inflammation, I believe, as do most observers, that the starting-point of such inflammation has been in the appendix. Recognizing that there are three pathological conditions included in intra-peritoneal inflammation in the right iliac fossa, and that it is only in exceptional cases that the diagnosis between typhlitis and peri-typhlitis can be made, is it not safer and more rational to dispose of all three conditions in the one manner? The differentiation between these conditions may be compared to an attempt to recognize the different coverings of a strangulated hernia, which, although existing anatomically, are practically indistinguishable. The differentiation between typhlitis and peri-typhlitis, I think, requires an astuteness greater than we are willing to concede even to the most expert.

Extra-peritoneal inflammation in the right iliac fossa includes that class of cases in which the tissues adjacent to the cæcum and the appendix are involved, and constitutes para-typhlitis. While I do believe there are cases of extra-peritoneal inflammation (para-typhlitis) that originate independently of any trouble in the appendix, and involve simply the connective tissue adjacent to the cæcum, I do not say that the starting-point of such an inflammation may not be in the appendix.

The latter condition may arise when the appendix lies posterior to the cæcum and the ascending colon. When the appendix is post-cæcal as well as post-colic, and is the seat of ulcerative inflammation, it is readily understood how, by extension, by continuity of tissue, the inflammatory process may involve the connective tissue adjacent to the appendix, and thus occasion a so-called para-typhlitis, also when perforation takes place between the folds of the mesentery of the appendix. This anomalous position of the appendix, when the seat of perforative appendicitis, also accounts for extra-peritoneal collections of pus in the right iliac fossa due to appendicitis, and not (in every instance) consequent solely upon inflammation of the connective tissue in the neighborhood of the cæcum. It likewise explains why abscess, the result of appendicitis, does not always point internally to the anterior superior spine of the ilium, but may from its position simulate peri-nephritic or lumbar abscess.

An intra-peritoneal inflammation, starting as appendicitis and forming a circumscribed swelling, shutting itself off from the general peritoneal cavity by the formation of adhesions, may go on to pus formation, and even rupture into the peri-cæcal and peri-colic tissues.

I am now prepared to assert that all inflammations of the right iliac fossa, not including those of inflammation of the overlying abdominal muscles, have their starting-point in the appendix; therefore I would expunge from the medical vocabulary the terms typhlitis, peri-typhlitis, and para-typhlitis, all of which I am convinced are misnomers, and only calculated to be a stumbling-block in the way of making a correct diagnosis, so essential to the proper treatment of the only inflammation here seen, namely, appendicitis. My reason for making this statement, which in the minds of many of our purely medical colleagues will doubtless seem preposterous, is that, of the many cases of inflammation in the right iliac fossa of the character about which I am speaking, I have yet to open the abdomen of one where the appendix was not at fault, and where, too, it presented the most destructive changes, granting that other of the neighboring tissues were involved. Further, upon the post-mortem table I have seen the abdomen opened where the diag-

nosis of peritonitis, typhlitis, or peri-typhlitis had been made, and in every instance the appendix showed ample macroscopical evidence of disease to satisfactorily explain the cause of the death. Having concluded, therefore, that all inflammations in the right iliac fossa take their origin in the appendix, it is next in order to classify the different pathological conditions of the appendix. All cases of appendicitis are divisible into five classes—catarrhal, obstructive (due to the presence of a foreign body, as a fecal concretion, an enterolith, a stricture, etc.), perforative, tubercular, and relapsing. The literature upon the subject of the etiology, the symptomatology, and the diagnosis of appendicitis is so complete that little, if any, of practical value could be added. I will therefore proceed to discuss the treatment.

The treatment which, to my mind offers the best opportunity for permanent relief is that of immediate removal of the offending appendix as soon as the diagnosis is established. My reason for adopting such a radical course has been forced upon me by the large number of cases I have seen perish when well-directed medical means had failed to afford relief, and in many cases of which the patients were beyond surgical aid. While I have seen cases of acute appendicitis recover without operation, this has not been the rule but the exception. Furthermore, being unable to subsequently observe the cases supposed to have recovered without operation, it is impossible to estimate how many of these suffered from relapses. Were reliable statistics available upon this point an arbitrary rule could be made. In support of the treatment of early removal I would state that all the cases in which I had the opportunity of operating early have, without exception, recovered, while of those in which abscess formed and, in many instances, ruptured into the general peritoneal cavity, comparatively few recover. I maintain that the risk of early operation, if skilfully performed, is less than that attendant upon the expectant plan of treatment. The cases, if any, which constitute the exception to this rule, are those where the symptoms abate upon free purgation, and embrace the catarrhal variety only. When early removal of the appendix is not feasible, the case is not usually

seen by the consultant until there is present a well-marked mass, which may be exudate alone, but which is more likely to be exudate and pus. There may be associated with the local trouble general peritonitis; the latter, if present, means in all probability that a communication has been established between the abscess cavity and the general peritoneal cavity, a condition which in the majority of instances does not offer the same chance of recovery as if the operation had been performed early.

The technique of the operation for appendicitis where abscess exists differs by reason of the different local conditions found, namely, when the abscess is circumscribed and shut off after the pus has been evacuated and the cavity irrigated, if the appendix cannot readily be found it is not judicious to make a prolonged search for it, by which the limiting wall may be broken through and a communication with the general peritoneum established. In this class of cases, however, I have been fortunate enough in most cases to find the appendix and remove it without breaking through the abscess wall. This is always more satisfactory to the surgeon than to complete the operation by simply draining or packing the abscess cavity; and further, it removes what may be the cause of one or more attacks of the relapsing variety of the disease. When the abscess is in communication with the general peritoneal cavity a more prolonged search for the appendix may be made with less risk than in the preceding state, except that the patient's general condition is usually so bad under these circumstances as to make it unwise to keep him under the effect of the anæsthetic any longer than is possible.

The points I observe in making the incision for the removal of the appendix in acute cases where there is present a mass, be it pus or exudate, are the following, namely: when the loin is rendered prominent by the mass or is the seat of œdema, I take this as an indication that the appendix holds a post-cæcal or an external antero-lateral position, or that it comes off from the apex of the cæcum, and I carry the incision parallel with and a short distance above the outer third of Poupart's ligament, prolonging it outward if necessary. When the mass presents itself well to the inner side of the anterior-superior spine of

the ilium, I carry the incision through the semilunar line—rather through the rectus muscle immediately, to the inner side of the semilunar line. The wound when carried through to the muscle heals more solidly, and therefore offers less likelihood to the development of a ventral hernia than when made in the semilunar line.

Of the obstructive and the perforative varieties of appendicitis, there is one form which partakes of the characteristics of both, namely, the explosive or fulminative. This form of the disease, fortunately but seldom seen in comparison with the other varieties, offers but little chance for relief by either medical or surgical means. The characteristic features of this variety are that within a short time after the onset of the trouble there is a general peritonitis of the most pronounced type, inability in almost all instances to elicit the physical signs, circumscribed tenderness, increased resistance, etc., so corroborative of the most usual forms of appendiceal disease, on account of their being obscured by the great amount of distention and the universal tenderness resulting from the general peritonitis. Again, the depressed condition of the patient as seen in the explosive type is out of all proportion to that of either of the other forms; this is undoubtedly due to septic absorption consequent upon the general septic peritonitis, the result of early rupture and of the appendix unloading its poisonous contents into the general peritoneal cavity, nature not having time to shut off the appendix by the deposit of inflammatory exudate. The absence of any attempt, perhaps I should say any successful attempt, on the part of nature to partition the general peritoneal cavity by the deposit of inflammatory exudate, thus isolating the appendix in a small compartment where it could deposit its contents without the risk of producing a general infective peritonitis, has been clearly demonstrated to those of us who have operated in this class of cases. Post-mortem examination shows, too, the free communication between the seat of perforation in the appendix and the peritoneal cavity, the presence of ichorous pus, and coils of small intestine glued together, not only in the ileo-cæcal region, but elsewhere as well, due to the general peritoneal inflammation. This general

deposit of exudate immobilizes the intestine and makes it difficult and, in many cases, impossible to obtain any action from salines or small and repeated doses of calomel. In this form of the disease vomiting is an early symptom, also stercoraceous vomiting. The explanation of the early vomiting, I believe, is due to the influence of the profound sepsis upon the pneumogastric nerves, and the stercoraceous vomiting to reversed peristalsis, caused by the intestines being both infiltrated with and confined by inflammatory deposits. Notwithstanding these cases are in almost every instance necessarily fatal, I can see but one means of relief, namely, operation, which should consist in the removal of the appendix, washing out the peritoneal cavity with a weak solution of carbolic acid, and drainage. In order for this to accomplish any good it must be done at once. After the case has progressed to any extent the patient will show evidence of shock, the result of nervous depression from sepsis, when operation will be of no avail. To advise against such radical treatment the following arguments will be brought forth: (1) that many cases of acute primary appendicitis recover without operation; (2) that the risk of the operation is by far greater than to allow the disease to take its course; (3) that it does not follow that there may be a second attack.

In answer to the first argument, while I do not for a moment question that many cases of acute primary appendicitis do get well, yet why is it the surgeon is so often called in to find the patient in collapse, though it be a primary attack? Do we not all appreciate that the mortality in the operation for acute appendicitis after abscess is formed is high? Are we not constantly hearing of deaths following the operation for appendicitis done at a late date, when, in some instances, the condition of the patient is such as not to warrant completing the operation, but simply evacuating the pus? Do we not see cases where nature has stepped in as the surgeon and evacuated the pus into the cæcum, the bladder, the vagina, and the rectum? Of these various avenues of spontaneous evacuation the first, that into the cæcum, is the most favorable, while the latter may leave the patient a cripple for life, a deformity, to say the least, difficult if not impossible to correct perfectly.

While I am not in a position (not having had sufficient experience in the removal of the appendix very early in the disease) to draw a just comparison between the mortality of, say, one hundred cases operated upon before abscess has formed, and the mortality of one hundred cases treated as they usually are, first expectantly, and latterly, if abscess form, perhaps by operation, I have no doubt but that the mortality of this series would be many times that of the first.

Operation for the removal of the appendix in acute primary appendicitis, if skilfully and aseptically performed, can add but little risk to the case. The operation is simple because our anatomical landmarks, so important to the successful performance of any operation, are not destroyed by the presence of an inflammation which has resulted in the formation of a mass of exudate or pus.

Under the circumstances, to repeat, a practical familiarity with the topographical anatomy of this region, with the different positions the appendix may hold, must of necessity make the operation comparatively easy. If in relapsing appendicitis the operation is simple, how much simpler must removal of the appendix be in a primary attack, where there are no inflammatory deposits, save, perhaps, a few recent adhesions which readily yield to pressure with the finger, and the bowel is not rendered friable by successive attacks of inflammation.

Convalescence from operation in early primary, as in relapsing appendicitis, is more rapid, as the wound in the abdominal walls is immediately closed, not requiring to be packed or drained as when an abscess is present. Fecal fistula will not follow operation if done early in acute primary appendicitis or in recurrent appendicitis, nor is ventral hernia so liable to occur.

There is but one other intra-peritoneal affection which demands as prompt interference as do many cases of appendicitis, namely, acute mechanical intestinal obstruction. The surgeon, when brought face to face with such a condition, must meet the issue squarely; while it is true there can be no fixed or fast rules in medicine, here should come in the exception. Experience alone can guide the surgeon to adopt the proper course to pursue. Too conservative scruples have lost many a patient

his life simply because it cannot be determined in appendicitis whether the case will terminate favorably or not. The earlier the offending viscus is removed the greater is the likelihood of a successful issue in the case. Many of the abscesses following appendicitis are unconfined either by a sac or a bank of lymph, and infect the peritoneum directly with a suppurative peritonitis, as a sequence causing a fatal termination. This, I think, would fully counterbalance any objection to early interference.

As to the propriety of the removal of the appendix in cases of recurrent appendicitis there is in my mind no doubt. While I am willing to admit that my experience has taught me that acute attacks of recurrent appendicitis are less fatal than primary appendicitis, yet I cannot see how this argues against removal of the appendix between attacks, the period for the elective operation. The argument that because a patient has survived a number of attacks of recurrent appendicitis the appendix should not be taken out, I am unable to understand the philosophy of, since each recurring attack may possess elements of danger unknown to us, which may deprive our patient of his life. Those of us who have observed these cases carefully know that many are the subjects of chronic invalidism. Many of these cases are treated for neurasthenia, hysteria, etc., by the well-known rest cure and massage, the mistake being due to the nervous symptoms which they present. Careful inquiry into the history of the case, with a searching physical examination by one whose sense of touch is educated, will reveal the nature of the trouble. I could cite several such, but as the object of the paper is not to make it a clinical report of cases, but to formulate my present views relative to the surgical management of all cases of appendicitis, I will make mention of but one case, the niece of a most excellent physician practising in Camden. The young woman in question suffered from the first attack seven years before I removed the appendix. During this time she had two acute attacks, from neither of which she completely recovered. Since the last attack, seventeen months before operation, she has spent the greater part of her time in bed. The only points demonstrable in this case were the presence of pain referred to the site of the appendix, and the presence of a tender

point of the size of a silver quarter corresponding also to the position of the normal appendix. The operation, which proved to be comparatively simple, was not followed by any untoward symptoms, the patient recovering completely, being now (some ten weeks since) well. The condition of the appendix when exposed did not convey the idea that it was wholly the cause of the prolonged suffering this poor woman underwent, yet to the touch it was rigid, and had evidently been the seat of catarrhal inflammation, resulting in great thickness of the submucosa, as proved by section.

The amount of disease in the appendix in recurrent appendicitis is not at all proportionate to the severity of the symptoms in save but few cases, the case mentioned above being an example of this.

In tubercular appendicitis the advisability of removing the appendix will depend upon the degree of local discomfort, the amount of general disturbance, etc. While I have been consulted to operate for tubercular appendicitis, I have never done so on account of the absence of serious local disturbance and the amount of tubercular involvement of the lungs present. In some of the cases of tubercular appendicitis there will be found, too, disseminated tubercle of the peritoneum, which, if present, call for free irrigation of the peritoneal cavity and drainage.

In concluding this brief paper I must caution against operation, when time is not an element, until the patient has been thoroughly prepared, by which I mean rest in bed for two, three, or more days before; limited but nutritious diet; and the most important I deem of all, the free evacuation of the bowels. Experienced operators will all bear witness to the importance of a clear alimentary canal in any abdominal operation. Yet, in acute attacks of appendicitis I always feel that the operation is certain to be followed by success if the patient has had two or more free evacuations during the day of operation; while, on the other hand, in the acute cases, when the bowels have been kept locked up, as it were, with opium, I confess I never feel sure of the result.